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BIOLOGICAL EVALUATION

JULIAN-CUYAMACA ZONE OF INFESTATION
LAGUNA MOUNTAIN PROJECT
CLEVELAND NATIONAL FOREST
SAN DIEGO COUNTY*

By
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INTRODUCTION

A biological evaluation of the bark beetle buildup in the Laguna Mountains was made by Forest Service and California Division of Forestry entomologists during the week of March 5, 1973. Private and Federal lands were examined and biological data collected for the evaluation of the proposed cooperative insect control project.

The proposed cooperative insect control project offers a means to suppress bark beetle populations, decrease tree mortality, and therefore provide some degree of protection to pine stands in high-use recreation areas and adjacent timberlands. The only bark beetle control on private land in the past has come from 10 percent of the District's pest control funds which is allowed for control on private lands. This new proposed cooperative insect control project will enable all the private lands to be treated, hence, strengthening the total Laguna Mountain insect control project.

BACKGROUND

Bark beetle control first began on Laguna Mountain in 1929 and continued intermittently until 1952. During this period, most of the effort was aimed at controlling the western pine beetle. In 1952, a maintenance control program was initiated against the western pine beetle and was expanded in 1957 to include the California flatheaded borer. The control program has been approved annually by the California Forest Pest Control Action Council.

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* This report serves as an addendum to the earlier evaluations applicable to Fiscal Year 1973. Those reports are the "Biological Evaluation, Laguna Mountain Bark Beetle Maintenance Control Project, Descanso Ranger District, Cleveland National Forest, January 1972," a "Supplemental Evaluation (Descanso District)" dated May 2, 1972, and "Bark Beetles - (GATR Burn)" dated August 11, 1972. All were issued by the Forest Service, Division of Timber Management, San Francisco, California.

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Forest Service crews have treated an average of 680 trees per year since 1962 on National Forest land. Additionally, since 1967 the Forest Service has treated an average of 53 trees per year on a small portion of private land.

LOCATION AND EXTENT OF INFESTATION

The infestation extends throughout the timbered portions of the Laguna Mountains, Descano District, Cleveland National Forest in San Diego County. There are approximately 7,200 timbered acres on National Forest land and 2,150 timbered acres of private land in the bark beetle maintenance control project for a total of 9,350 acres.

The District has on file a long-range insect control plan which delineates the infestation areas on Federal lands into treatment intensity classes and work priorities. Private timberlands within the Julian-Cuyamaca Zone of Infestation have also been delineated into intensity classes and work priorities in order to coordinate control activities. Intensity is broken into four classes with Class I designated to receive continuous treatment and Class II to receive seasonal treatment. Work priorities are categories A (1st priority), B (2nd priority), and C (3rd priority), and only apply to intensity Classes I and II. Classes III and IV are low-use areas which require separate evaluations before control work can be approved for funding.

Acreage figures for Federal and private timberland by work priorities are shown below for intensity Classes I and II:

Acreage of Federal and Private Timberland by Work Priorities

Work Priorities	Federal	Private
A	2,700	740
B	2,820	700
C	1,000	710
Total -	6,520	2,150

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ENVIRONMENTAL FACTORS

Moisture. Periodic drought conditions favor insect outbreaks by putting serious moisture stress on timber stands. Normal moisture is 25 inches in the Laguna Mountains, which makes pine production marginal for that particular latitude and elevation. Precipitation from July 1, 1972 to March 5, 1973 totalled 17.33 inches, while only 10.78 inches of precipitation fell in 1971. Sixty percent of normal rainfall fell in 1969 and 1970.

Fire Damage. Historically, fire has played its role in influencing the vegetational composition found in the Laguna Mountains. The most recent fire burned 80 acres of Jeffrey pine, July 2, 1972, near Camp Ole. The Laguna Fire of September 1970 burned 1,000 acres of timberland and another 174,400 acres of brush and grass lands. Logging and fuelwood cutting, plus some burying of logs helped remove some of the trees killed or damaged, but some material is still available for insect attack.

BIOLOGICAL INFORMATION

An estimated 6,000 dead and dying pines are infested with California flatheaded borer, pine engraver beetles and western pine beetles on the 9,350 acres of private and National Forest timberland in the Laguna Mountains. California flatheaded borer has been the main insect responsible for the majority of pine mortality with pine engraver beetle important but less so, and western pine beetle a minor factor in Coulter pine mortality. Larvae and prepupae of the California flatheaded borer were found as well as parent adults and early instar larvae of the western pine beetle.

Bark samples with evidence of borer feeding were collected at breast height and on opposite sides of the tree from nine trees at four locations. These samples were X-rayed in the laboratory and the X-rays were developed and interpreted to determine beetle stage and numbers. Radiographs showed borers in the larval and prepupal stages with an average of 18 larvae per square foot. Number of borers per square foot ranged from zero to 50. Only one predator larva was detected in the 18 samples. Woodpecker predation varied from light to heavy on the trees observed, which only represented a small sample.

1/ Additional environmental factors are discussed in the "Biological Evaluation, Laguna Mountain Bark Beetle Maintenance Control Project" dated January 1972.

DISCUSSION

The pine stand on the Laguna Mountains is currently being severely attacked by California flatheaded borer. Other bark beetles causing mortality are the pine engraver beetle and western pine beetle. Unfortunately, inclement weather precluded obtaining an adequate bark sample of California flatheaded borer. In X-ray samples, an average of 18 larvae per square foot were found and there are an estimated 6,000 infested trees. In 1968, X-rayed bark samples had an average of 15 larvae per square foot and only 596 trees were treated, which represented most of the infested trees. In the current infestation, very little predator or parasite activity was observed. Consequently, from the small sample obtained it appears the California flatheaded borer population is increasing.

The magnitude of the infestation precludes successful suppression with insecticide treatment due to financing, manpower, and time restrictions. Salvage logging and fuelwood sales offer the best alternative for suppression of infested timber through removal of the infested material from the forest environment. A great number of the merchantable infested trees and the bulk of the beetle population can then be removed to areas lacking pine hosts.

In the past it has been difficult to make timber sales because of the 150 mile haul to the nearest large capacity mill -- Big Bear Timber Company in Redlands. Current conditions favoring the sale are: (1) the record high prices for lumber, (2) the lack of inventory at the mill (presently the mill is closed because snow has stopped logging operation elsewhere and the mill log decks are bare), (3) the general lack of proposed timber sales in southern California, and (4) an estimated large volume of infested logs, about 3/4 MMBF on all ownerships. The salvage operation may also be benefited by the two fuelbreak modification projects on National Forest lands. There is an estimated 2 MMBF to be sold during Fiscal Year 1974.

Fuelwood sales can provide an outlet for infested material when that material is moved several miles from the Forest. Therefore, professional wood cutters and San Diego residents with wood storage areas away from the Jeffrey pine type could be utilized.

The chemical treatment of infested trees in high-use areas not conducive to logging or wood sales should continue concurrently. Federal and State crews should coordinate their activities on contiguous, high-use areas.

RECOMMENDATIONS

1. Salvage Logging. The maximum effort in insect control should be directed towards removal of infested material through salvage logging. The California Division of Forestry and Forest Service must work quickly to locate interested logging contractors, establish contracts, and mark the merchantable trees to enable removal of as much infested material as possible before beetle emergence in May or June.

2. Fuelwood Sales. Outlets for infested fuelwood should be examined to enable removal of small diameter material not attractive to contract loggers.

3. Insecticide Application. The cooperative control project should be implemented as soon as possible to enable treatment of infested material in Class I and II priority areas on private lands. Concurrently, the Forest Service should treat infestations in high-use priority areas which are not conducive to salvage logging.